

**WHAT IS CLAIMED IS:**

1. A semiconductor device having a substrate, the device comprising:  
an active circuit layer formed proximate to the semiconductor substrate;  
a component layer comprising at least one radio frequency (RF) passive component  
formed therein; and  
a first shielding layer positioned between the active circuit layer and the component layer,  
wherein the first shielding layer includes at least a first opening formed therein.
2. The semiconductor device of claim 1 further comprising a second shielding layer  
positioned between the active circuit layer and the component layer.
3. The semiconductor device of claim 2 further comprising a guard ring connected to  
both the first and second shielding layers.
4. The semiconductor device of claim 3 wherein the guard ring comprises a via strip.
5. The semiconductor device of claim 4, wherein at least one of the first shielding  
layer, the second shielding layer, and the guard ring is made from a highly conductive material.
6. The semiconductor device of claim 5, wherein the highly conductive material is  
selected from a group consisting of copper, aluminum, polycrystalline silicon, tungsten, metal  
silicide, and combinations thereof.
7. The semiconductor device of claim 2, wherein at least one of the first and second  
shielding layers is grounded or connected to a fixed voltage potential.
8. The semiconductor device of claim 2 wherein the second shielding layer includes  
at least a second opening formed therein.

9. The semiconductor device of claim 8, wherein the second opening is offset from the first opening.

10. The semiconductor device of claim 8 wherein at least one of the first opening and the second opening is a slot.

11. The semiconductor device of claim 8 wherein at least one of the first opening and the second opening is a hole.

12. The semiconductor device of claim 10 wherein an orientation of the first opening differs from an orientation of the second opening.

13. The semiconductor device of claim 1 wherein the at least one RF passive component comprises a capacitor, a resistor, an inductor, or combinations thereof.

14. The semiconductor device of claim 1 wherein the substrate comprises an elemental semiconductor.

15. The semiconductor device of claim 1 wherein the substrate comprises a compound semiconductor.

16. The semiconductor device of claim 1 wherein the substrate comprises an alloy semiconductor.

17. The semiconductor device of claim 1 wherein the substrate is selected from a group consisting of a metal-oxide-semiconductor field effect transistor, a bipolar transistor, a capacitor, a resistor, an inductor, and combinations thereof.

18. The semiconductor device of claim 1 wherein the active circuit layer comprises an interconnection structure.

19. The semiconductor device of claim 18 wherein the interconnection structure is made from a material selected from the group consisting of copper, aluminum, polycrystalline silicon, tungsten, metal silicide, and combinations thereof.

20. A shielding structure for a radio frequency integrated circuit (RFIC), wherein the RFIC includes a first structural layer having at least one RF passive component and a second structural layer having routing for active components, the shielding structure comprising:

a first conductive shielding layer positioned between the first and second structural layers, wherein the first conductive layer has at least one opening formed therein;

a second conductive shielding layer positioned between the first and second structural layers and proximate to the first conductive shielding layer, wherein the second conductive shielding layer has a second opening formed therein; and

a guard ring connected to the first and second conductive shielding layers, wherein the first and second conductive shielding layers are connected to a common voltage potential.

21. The shielding structure of claim 20 wherein the first opening is offset from the second opening.

22. A method for providing shielding in an integrated circuit formed on a substrate, the method comprising:

forming a first structural layer on the substrate, wherein the first structural layer comprises either metal routing or radio frequency passive (RF) components;

forming a first shielding layer above the first structural layer;

patterning the first shielding layer to form at least one opening in the first shielding layer; and

forming a second structural layer above the first shielding layer, wherein the second structural layer comprises RF passive components if the first structural layer comprises metal routing, and wherein the second structural layer comprises metal routing if the first structural layer comprises RF passive components.

23. The method of claim 22 further comprising:  
forming a second shielding layer proximate to the first shielding layer; and  
 patterning the second shielding layer to form at least one opening in the second shielding layer.
24. The method of claim 23 wherein patterning the second shielding layer includes offsetting the second opening from the first opening.
25. The method of claim 23 further comprising connecting at least one of the first and second shielding layers to a common voltage potential.
26. The method of claim 25 further comprising forming a guard ring to connect the first and second shielding layers.
27. A semiconductor device having a substrate, the device comprising:  
a metal routing layer for an active circuit formed proximate to the substrate;  
a radio frequency (RF) layer having at least one RF component formed therein; and  
 a first metal shielding layer positioned between the routing layer and the RF layer,  
wherein the first metal shielding layer has a first opening formed therein.
28. The semiconductor device of claim 27 further comprising a second shielding layer positioned between the metal routing layer and the RF layer.
29. The semiconductor device of claim 28 further comprising a guard ring connecting the first and second metal shielding layers.